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United States
Department of
Agriculture

Soil
Conservation
Service

Montana
Agricultural
Experiment
Station

Bozeman,
Montana

MONTANA WATER SUPPLY OUTLOOK

St. H.
Snowpack and Streamflow
Forecasts as of
February 1, 1985



UNITED STATES DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE

SNOW SURVEY UNIT

Federal Bldg., Rm. 443
10 East Babcock Street
Bozeman, MT 59715

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How cold was it?

The cold spell we experienced near the end of January was by far the coldest of the winter. Few areas in the state escaped the temperatures which dropped far below minus 20 degrees Fahrenheit.

Cold air drainage in the higher mountain valleys causes cold air to "puddle" in low areas and can produce some extremely low temperatures.

Locations such as the areas around Butte and West Yellowstone have become notorious for producing record lows for the nation.

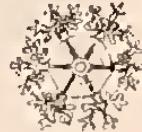
On January 20, 1954, the coldest temperature ever recorded in the Continental United States, a minus 69.7°F, was recorded on Rogers Pass near Helena.

Within the SNOTEL reporting system there are several sites that we expect to record extremely low temperatures. Several have done just that. The coldest temperatures recorded this winter and the locations where they were measured are shown below.

Site	Area	Temp	Date
Calvert Creek	North of Wisdom	-41°F	2-4-85
Nevada Creek	South of Lincoln	-45°F	1-30-85
Casin Creek	South of Butte	-52°F	2-4-85
Whiskey Creek	South of W.Yellowstone	-58°F	1-31-85

The Montana Water Supply Outlook is a publication of the U. S. Soil Conservation Service. The SCS administers the Cooperative Snow Survey Program in cooperation with other federal, state and private agencies, organizations, and individuals.

The report is prepared by SCS, Snow Survey and Water Supply Forecast Staff, Room 443, Federal Building, 10 East Babcock, Bozeman, Montana.



Low snowfall in January

January produced very little snowfall across Montana. The weather patterns that brought large amounts of snowfall to most areas in the state in late December have shifted to cold and dry weather.

In a normal year, about one-fourth of the season's snow accumulation is deposited during the month of January.

As a result, the snowpack percentages have dropped significantly. Presently, the northern half of the state has average or a little above average snowpack while most of the southern half is below average.

Generally, about two-thirds of the season's snowpack has accumulated by February 1. This means the weather patterns that develop over the next 2 to 3 months become very critical in determining the seasonal snowpack levels and the subsequent spring and summer runoffs.



Streamflow forecasts drop

As a result of deficient January snowfall, streamflow forecasts have dropped significantly since last month. Present predictions of spring and summer streamflow are in the near average range for the northern areas of the state and for some of the streams in the southwest. Much of the southern half of Montana can expect runoff 10 to 15 percent below average.

Missouri River & Hudson Bay Drainages

STREAMFLOW FORECASTS

BASIN, STREAM and/or FORECAST POINT	THIS YEAR		PAST RECORD		THIS YEAR		PAST RECORD	
	FORECAST	THOUSAND ACRE FEET	THOUSAND ACRE FEET	AGREEMENT	FORECAST	THOUSAND ACRE FEET	THOUSAND ACRE FEET	AGREEMENT
PERIOD								
APRIL - SEPTEMBER								
APRIL - JULY								
PEO ROCK RIVER near Monida (1)	97.0	94	244	103	86.8	93	212	96.3
BEAVERHEAD RIVER near Grant (2)	152	96	135	158	130	95	337	137
BEAVERHEAD RIVER at Barratts (2)	196	94	209	168	93	180		
RUBY RIVER near Alder	91.0	90	101	75.0	89	81.6		
BIG HOLE RIVER near Melrose	688	91	760	635	91	698		
WILLOW CREEK near Harrison	16.6	83	20.0	15.0	84	17.8		
WADISON RIVER near Gravilson (3)	440	89	575	496	345	89	440	388
WADISON RIVER near McAllister (4)	735	87	1,114	610	595	89	874	672
CALLATIN RIVER near Gateway	440	81	545	370	80	464		
SUM of EAST+WEST FORKS HYALITE CR. nr Bozeman (5)	22.9	80	28.6	19.2	78	21.7		
HYALITE CREEK near Bozeman (6)	35.7	80	44.8	30.5	79	38.7		
CALLATIN RIVER at Logan	484	79	611	415	79	523		
MISSOURI RIVER at Toston (7)	2,120	90	3,827	2,545	2,000	91	3,179	2,196
MISSOURI RIVER near White Sulphur Springs	19.4	89	21.8	14.8	88	19.0		
SUN RIVER at Gibson Gap (8)	545	99	336	570	520	100	296	522
BELT CREEK near Monarch	120	90	134	112	91	123		
MISSOURI RIVER at Fort Benton (9)	3,540	89	3,980	3,120	90	3,468		
TWO MEDOCINE CREEK near Browning (10)	250	101	298	239	102	235		
BADGER CREEK near Browning	133	102	130	115	102	113		
INFLOW SWIFI RESERVOIR near Dupover	86.5	100	86.7	75.0	100	71.7		
CUT BANK CREEK at Cut Bank	113	99	114	105	97	108		
HARTAS RIVER near Shelby	555	102	512	525	101	518		
MISSOURI RIVER at Virgelle (11)	4,280	93	4,570	3,700	92	4,030		
MISSOURI RIVER near Landusky (11)	1,550	91	4,980	3,950	90	4,383		
NORTH FORK HUSSLELL RIVER near Ocipine	5.7	89	6.4	4.8	89	5.4		
SOUTH FORK HUSSLELL RIVER above Martinsdale	55.8	89	62.8	53.5	91	58.9		
MISSOURI RIVER below Fort Peck Dam (11)	4,500	91	4,961	3,985	90	4,428		
MILK RIVER at Eastern Crossing (Mar-Sep.)	122	112	109					
MILK RIVER at Eastern Crossing (12) (Mar-Sep.)	300	108	279					
INFLOW LAKE SAKAKAHEA HD (11)	11,480	90	12,735	10,890	89	12,239		
SASKATCHEWAN RIVER BASIN								
SHIFTCURRENT CREEK at Sherburne (13)	130	102	102	128	101	87.4	112	
ST. MARY'S RIVER near Babb (13)	490	101	487	415	100	416		

SUMMARY OF SNOW MEASUREMENTS (COMPARISON WITH PREVIOUS YEARS)					
RIVER BASIN AND SUB-WATERSHED	Number of Counties Affected	THIS YEAR'S SNOW MATERIAL AS PERCENT LAST YEAR	LAST YEAR	ANNUAL	ANNUAL
Beaverhead	14	98	90		
Beaverhead	4	82	87		
Ruby	Avg	Avg			
Big Hole	Avg	Avg			
Boulder	Avg	Avg			
Jefferson	Avg	Fair			
Madison	Avg	Avg			
Gallatin	Avg	Avg			
West-Side Missouri	Avg	Fair			
Smith-Belt	Avg	Fair			
Sun	Avg	Avg			
Teton	Avg	Avg			
Maries	Avg	Avg			
Judith	Avg	Fair			
Musselshell	Avg	Fair			
Milk	Avg	Avg			
Bear Paws	Avg	Avg			
St. Mary's	Avg	Avg			
Saskatchewan					
St. Mary's	5	186	106		
Bow River in					
Alberta	6	110	90		

Missouri forecasts revised downward

All forecasts have been revised downward because of deficient January precipitation.

Current predictions of spring and summer streamflow are for 10 to 15 percent below average runoff on most tributaries in the Missouri River headwaters. Tributaries east of the Missouri River are also forecast to be below average. Best streams on the west side downstream from Canyon Ferry Reservoir should have near average streamflows.

January snowfall below average

There was a major turnaround in snowfall during January. Mountain precipitation was very light across the entire drainage with monthly increases of about 1/2 to 1 inch. Normally, 3 to 7 inches of moisture can be expected.

The present snowpack is now below average in most of the headwater areas except for a small part of the Madison River headwaters in Yellowstone National Park. Most of the Missouri main-stem streams are near average.

A month ago, this area was well above average due to large December storms. The jet stream that helped bring in this moisture and mild temperatures in December was flowing west to east across Montana. More recently, it has been traveling from northwest to southeast and bringing cold temperatures with very little moisture.

With these drastic changes in our weather patterns, it becomes very difficult to project how much snowpack will be accumulated this season. As time goes on, hopefully, the patterns will become a little more stable.



MISSOURI RIVER & HUDSON BAY DRAINAGES
MONTANA
MOUNTAIN SNOW WATER EQUIVALENT

SNOW SURVEY DATA

FEBRUARY 1985

SNOW COURSE	EL ELEVATION	DATE	SNOW DEPTH	WATER CONTENT	LAST YEAR	AVERAGE 1961-80
NOISY BASIN	6040	1/30/85	95	32.0	28.3	28.7
NOISY BASIN BUTYL	6030	2/01/85	28.0	25.1	24.2	
NORTH FORK ELI CREEK	6250	1/28/85	30	7.6	4.8	9.0
NORTH FORK ELY CREEK BUTYL	6250	2/01/85	---	7.6	7.6	7.9
NORTH FORK JOCO	6330	2/05/85	75	25.5	24.4	29.1
N.E. ENTRANCE BUTYL	7350	2/01/85	22	4.4	4.4	7.2
OPHIR PARC	7150	2/02/85	36	10.2	9.2	12.0
PETERSON HEADW	7200	2/06/85	30	6.8	4.6	7.0
PETERSON HOW BUTYL	7200	2/06/85	---	6.6	4.7	6.7
PICFOOT CRK METAL	6650	2/01/85	7.4	5.3	7.7	
PIKE CREEK BUTYL	5930	2/01/85	20.0	10.9	18.5	
PLACER PASS	7200	1/28/85	16	3.3	1.0	3.8
PLACER BASIN METAL	8030	2/01/85	---	10.5	9.9	11.5
POORHORN CREEK	5100	1/30/85	78	26.9	15.3	23.9
POORHORN CRK BUTYL	5100	2/01/85	---	27.3	12.6	22.0
POURCUE BUTYL	6500	2/01/85	4.3	4.1	4.0	
RED TOP	5260	2/05/85	60	23.9	11.4	20.2
ROCKER PEAR BUTYL	8000	2/01/85	8.5	5.4	10.5	
ROCKY BOY	1700	1/29/85	21	4.4	2.8	3.6
ROCKY BOY BUTYL	4700	1/29/85	---	4.4	3.0	3.4
SADDLE MOUNTAIN	7900	1/30/85	49	15.0	14.4	17.9
SADDLE MTH BUTYL	7900	2/01/85	---	14.9	14.5	17.7

Columbia River Drainage

STREAMFLOW FORECASTS

BASIN, STREAM AND FORECAST POINT	THIS YEAR				PAST RECORD				THIS YEAR				PAST RECORD				
	FORECAST		PAST RECORD		FORECAST		PAST RECORD		FORECAST		PAST RECORD		FORECAST		PAST RECORD		
	THOUSAND A.C.FEET	PERCENT AVGAGE	LEVEE	EXPOSURE													
PERIOD																	
APRIL - SEPTEMBER																	
APRIL - JULY																	
APRIL - JUNE																	
KOOTENAI RIVER below Libby Dam (1)	6,640	94	5,466	7,041	5,680	94	4,520	6,020									
FISHER RIVER near Libby	285	108		264	270	109		248									
YAK RIVER near Troy	485	93		523	460	92		500									
KOOTENAI RIVER at Leona (1)	7,960	93	6,534	8,602	6,910	93	5,596	7,498	5,500	91	4,282	6,051					
INFLOW MOUTON RESERVOIR nr Butte (Million Gallons)				230	87	182	263	210	89	179	237						
WARM SPRINGS CREEK AT HEYMERS OAM near Anaconda (2)	43.4	93		46.8	35.0	93		37.8									
FLINT CREEK near Southern Cross (3)	16.4	90	26.3	18.3	13.8	90	21.3	15.4									
FLINT CREEK below Boulder Creek (4)	67.5	89		75.0	53.5	90		59.5									
INFLOW LOWER WILLOW CREEK RESERVOIR near Hall (5)	14.0	89	11.6	15.7	13.2	88	10.2	14.9									
MIDDLE FORK ROCK CREEK near Philipsburg	70.9	91		78.2	64.0	91		70.5									
NEVADA CREEK near Finn	19.8	86		23.0	18.4	86		21.3									
BLACKFOOT RIVER near Bonner	930	93		999	830	92		904	718	92		782					
CLARK FORK RIVER above Hilltown (6)	740	91		816	640	90		708	545	91		597					
CLARK FORK RIVER above Missoula	1,670	92	1,565	1,815	1,470	91	1,360	1,612	1,263	92	880	1,379					
WEST BITTERROOT RIVER near Conner (7)	158	89		178	150	91		144									
BITTERROOT RIVER near Darby	512	88		580	475	89		532	919	90		464					
SKALKAHO CREEK near Hamilton	68.8	87		56.0	42.5	87		48.7									
BURNT FORK CREEK near Stevensville (8)	32.5	87		37.0	28.4	88		32.2									
BITTERROOT RIVER at Missoula (9)	1,295	86		1,504	1,200	87		1,384	1,040	87		1,191					
CLARK FORK RIVER below Missoula	2,970	90		3,319	2,670	90		2,996	2,303	90		2,570					
CLARK FORK RIVER at St. Regis	4,010	91	3,732	4,411	3,620	91	3,322	3,928	3,120	91	2,825	3,428					
NORTH FORK FLATHEAD RIVER near Columbia Falls	1,925	101		1,913	1,750	101		1,732	1,490	101		1,471					
MIDDLE FORK FLATHEAD RIVER near West Glacier	1,850	99	1,316	1,089	1,710	100	1,236	1,713	1,425	98	1,086	1,453					
SOUTH FORK FLATHEAD RIVER near Columbia Falls (10)	2,280	100	1,515	2,278	2,150	100	1,694	2,142	1,870	99	1,416	1,886					
FLATHEAD RIVER at Columbia Falls (10)	6,165	99	4,738	6,209	5,770	101	4,294	5,721	5,015	102	3,589	4,921					
FLATHEAD RIVER near Polson (11)	7,370	101	5,586	7,278	6,865	102	5,102	6,712	5,834	101	4,284	5,759					
CLARK FORK RIVER near Plains (11)	11,700	96	9,695	12,153	10,700	97	8,910	11,071	9,175	97	7,457	9,459					
THOMPSON RIVER near Thompson Falls	275	105		261	250	107		233									
PROSPECT CREEK at Thompson Falls	155	109		142	145	110		132									
CLARK FORK RIVER at Whitehorse Rapids (12)	12,900	95	13,575	11,700	95		12,351	10,040	95		10,570						

(1) Adjusted for storage in Lake Koocanusa.
(2) Adjusted for storage in Silver Lake, diversions to and pumping from Georgetown Lake.
(3) Adjusted for storage in Georgetown Lake, diversions from and pumping to Silver Lake.
(4) Sun Flats Creek at Missoula and Boulder Creek at Missoula.
(5) Sun of North Fork Lower Willow Creek near Hall and South Fork Lower Willow Creek near Hall.
(6) Difference is observed flow Clark Fork above Missoula and Blackfoot near Bonner.

ALL FORECASTS PREPARED IN COOPERATION WITH THE NATIONAL WEATHER SERVICE

Columbia streamflow forecasts lowered

Streamflow forecasts have been lowered significantly due to lack of mountain precipitation in January.

Presently, predictions for spring and summer runoff are for near average flows on most streams and rivers in the northern part of the area and a little below average flows from southern drainages.



Snowpack percentages drop in Columbia

Snowfall in January was very low. Heavy snowpack areas that normally receive 6 to 8 inches of moisture generally picked up less than 2 inches. Snow surveyors reported that January 1 snowshoe tracks and snow sampling holes in the snow are still visible at some snow courses.

This very low precipitation for January has significantly dropped the snowpack percentages.

Areas that were well above average last month are now near average. Areas that were average are now below average.

At the present time, only a small area along the Montana-Idaho line from Lolo Pass to west of Libby has above average snowpack. Almost all of the Kootenai and Flathead River drainages and the northern part of the Blackfoot River have near average snow cover. Below average snowpack covers the Bitterroot, Upper Clark Fork and south half of the Blackfoot River drainages.

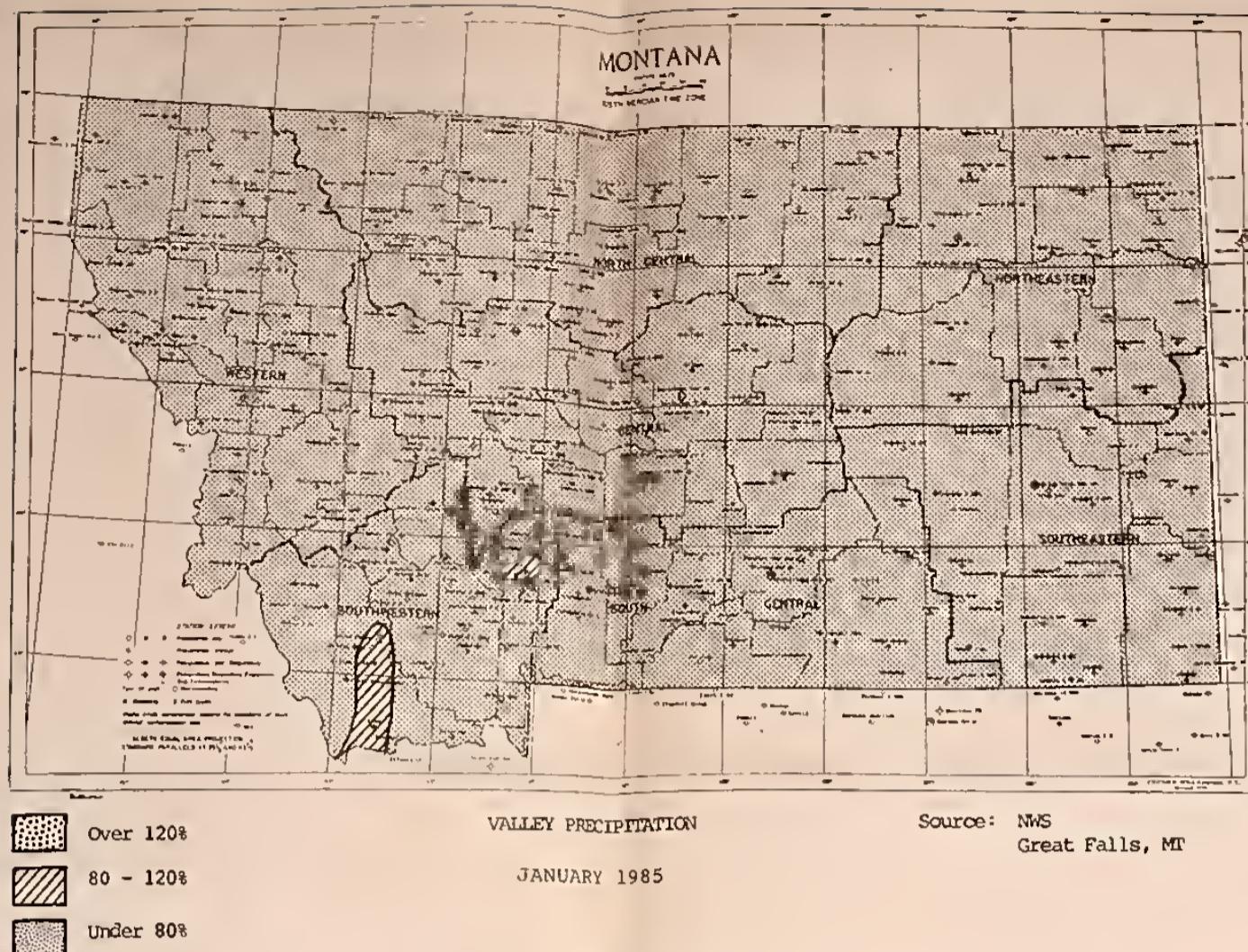


COLUMBIA RIVER DRAINAGE
MONTANA
MOUNTAIN SNOW WATER EQUIVALENT

Yellowstone River Drainage

STREAMFLOW FORECASTS

BASIN, STREAM AND FORECAST POINT	STREAMFLOW FORECASTS				PAST RECORD				THIS YEAR				PAST RECORD			
	THIS YEAR	FORECAST	THOUSAND A.C.FEET	PERCENT AVGAGE	THIS YEAR	FORECAST	THOUSAND A.C.FEET	PERCENT AVGAGE	THIS YEAR	FORECAST	THOUSAND A.C.FEET	PERCENT AVGAGE	THIS YEAR	FORECAST	THOUSAND A.C.FEET	PERCENT AVGAGE



This winter's snow accumulation is below average in many mountain areas.

AGENCIES AND ORGANIZATIONS COOPERATING IN MONTANA SNOW SURVEYS

GOVERNMENT AGENCIES

Canada

Department of the Environment
Atmospheric Environment Service
Water Management Service
British Columbia Ministry of Environment
Inventory and Engineering Branch, Hydrology Section

Alberta Environment
Technical Services Division

Federal

Department of the Army - Corps of Engineers
Department of Agriculture - Forest Service
- Soil Conservation Service
Department of Commerce - National Environmental Satellite Service
- National Weather Service
Department of Interior - Bureau of Indian Affairs
- Fish and Wildlife Service
- Geological Survey
- National Park Service
- Bureau of Reclamation
Department of Energy - Bonneville Power Administration

STATE AGENCIES

Montana Conservation Districts
Montana Department of Fish, Wildlife and Parks
Montana Department of Natural Resources and Conservation
Montana State University - Agricultural Experiment Station
University of Montana - School of Forestry

PRIVATE ORGANIZATIONS

The Anaconda Company
Big Sky of Montana
Butte Water Company
Flathead Valley Community College
Montana Power Company
Pondera County Canal & Reservoir Company

Other organizations and individuals furnish valuable information for snow survey reports. Their cooperation is gratefully acknowledged.

RESERVOIR STORAGE (Thousand Acre Feet) END OF MONTH January 31, 1985

Basin or Stream	RESERVOIR	Usable Capacity	Usable Storage		
			This Year	Last Year	Average
COLUMBIA					
Kootenai	Koocanusa	5,748.2	2,113.0	3,619.0	2,406.0
Flathead	Hungry Horse	3,451.0	2,308.0	2,611.0	2,353.0
	Flathead Lake	1,791.0	835.3	875.0	1,179.0
	Camas (4)	45.2	17.0	29.0	11.1
Clark Fork	Mission Valley (8)	100.3	34.7	55.9	36.6
	Georgetown Lake	31.0	26.6	27.5	26.9
	Lower Willow Creek	4.9	0.3	3.3	1.4
	Nevada Creek	12.6	4.3	6.9	4.4
Bitterroot	Noxon Rapids	334.6	323.7	318.9	312.2
	Painted Rocks	31.7	---	8.7	16.5
	Como	34.9	7.9	10.8	10.5
MISSOURI					
Beaverhead	Lima	84.0	25.9	51.4	34.4
	Clark Canyon	257.2	149.2	177.1	138.7
Ruby	Ruby	38.8	24.1	27.0	23.3
Madison	Hebgen Lake	377.5	310.2	262.1	232.6
Gallatin	Ennis Lake	41.0	31.0	30.3	35.6
Missouri	Middle Creek	8.0	3.8	3.9	3.3
	Canyon Ferry	2,043.0	1,459.0	1,723.0	1,613.0
	Hauser & Helena	61.9	63.2	63.0	60.4
	Helena Valley	9.2	4.6	4.3	5.6
	Lake Helena	10.4	10.9	10.9	10.0
	Holter Lake	81.9	76.3	81.0	69.4
Smith	Fort Peck Lake	18,910.0	15,900.0	16,050.0	15,050.0
	Smith River	10.6	8.8	9.2	6.5
Musselshell	Newlan Creek	12.4	9.8	8.8	9.2
	Bair	7.0	0.4	2.9	4.3
	Martinsdale	23.1	5.8	13.9	9.5
Sun	Deadman's Basin	72.2	---	56.5	43.2
	Gibson	99.1	47.1	50.6	40.8
	Willow Creek	32.2	12.6	24.3	20.4
	Pishkun	32.0	18.5	19.6	16.5
Marias	Lower Two Medicine	11.9	---	---	6.8
	Four Horns	19.2	---	---	12.5
	Swift	30.0	7.9	11.9	14.1
	Lake Frances	111.9	23.8	47.2	70.0
Milk	Elwell (Tiber)	1,347.0	675.8	692.3	545.6
	Beaver Creek	3.5	0.9	3.1	1.7
	Fresno	127.2	9.9	24.6	58.0
	Nelson	66.8	13.2	40.5	40.0
HUDSON BAY					
St. Mary's	Lake Sherburne	64.3	35.2	37.3	19.5
YELLOWSTONE					
Stillwater	Mystic Lake	21.0	2.3	7.5	10.3
Clark's Fork	Cooney	27.4	18.8	16.5	14.0
Tongue	Tongue River	68.0	16.6	14.7	30.2
Bighorn	Bighorn Lake	1,356.0	907.4	879.6	609.2